

ABSTRACT

A digital payload for processing a sub-band spectrum received on an uplink beam at a communications satellite includes a digital channelizer, a digital switch matrix and a digital combiner. The digital channelizer divides the sub-band spectrum into a plurality of frequency slices that can be routed by the digital switch matrix to any of a number of receiving ports. A digital combiner receives the frequency slices and re-assembles them to form one or more output sub-bands for transmission on an output beam of the communications satellite. The digital payload may also include an embeddable digital regeneration module configured to demodulate some or all of the sub-band spectrum to extract a digital bitstream therefrom. The digital bitstream may be processed to implement code-based multiplexing, switching, access control, and other features.